The Examiner has alleged that the presently pending claims are directed to 20 separate patentably distinct species of the claimed invention as allegedly set forth in pages 5-9 of the originally filed specification. This assertion by the Examiner and follow-on election of species requirement is respectfully traversed.

Pages 5-9 set forth, in summary form, the various aspects of the present invention that are disclosed in the originally filed specification. Pages 5-9 do not set forth all the various aspects of the present invention that are claimed in the pending claims of the above-identified application. Accordingly, it is improper to base an election of species requirement upon what is disclosed in the originally filed specification because an election of species requirement must be directed to the claimed invention or inventions as specifically set forth by the pending claims.

Furthermore, the Examiner has failed to provide a prima facie case that the alleged embodiments have a species relationship. For example, the Examiner apparently alleges that a laminated MEMS wafer is a species a method of making a protected laminated wafer. The Applicants respectfully assert that these two examples do not have a species relationship.

However, assuming that the Examiner can actually demonstrate a species relationship between these various aspects of the present invention as set forth in pages 5-9 of the originally filed specification, the Applicants respectfully submit that claims 1-80, 122-130, and 137-139 read upon the 8^{th} aspect of the present invention as set forth in pages 5-9 of the originally filed specification, and claims 81-121, 131-136, and 140-145 read upon the 11^{th} aspect of the present invention as set forth in pages 5-9 of the originally filed specification. As noted before, the Applicants respectfully maintain that the 8^{th} aspect of the present invention as set forth in pages 5-9 of the originally filed specification and the 11^{th} aspect of the present invention as set forth in pages 5-9 of the originally filed specification fail to have any species relationship therebetween.

In view of the above discussion, the Applicants, elect, with traverse, claims 1-80, 122-130, and 137-139, which read upon the 8^{th} aspect of the present invention as set forth in pages 5-9 of the originally filed specification.

Accordingly, in view of all the reasons set forth above, the Examiner is respectfully requested to reconsider and withdraw this election of species requirement. Also, an early indication of allowability is earnestly solicited.

Attached to this Response is a clean set of pages 16, 20, and 23 of the specification incorporating the amendments presented above.

Respectfully submitted,

Matthew E. Connors
Registration No. 33,298
Samuels, Gauthier & Stevens
225 Franklin Street, Suite 3300
Boston, Massachusetts 02110
Telephone: (617) 426-9180
Extension 112

MEC/MJN/mjn
Attachments

structures so as to provide clearance for surface MEMS structures. The spacer layer **101** and tape **103** may be combined and then cut to produce areas corresponding to the MEMS structures on the MEMS wafer, cut by a laser to produce areas corresponding to the MEMS structures on the MEMS wafer, or punched to produce areas corresponding to the MEMS structures on the MEMS wafer. The spacer layer **101** and tape **103** may also be pre-combined and cut or punched to produce areas corresponding to the MEMS structures on the MEMS wafer; or before being combined, the spacer layer **101** and tape **103** may also be pre-cut or pre-punched to produce areas corresponding to the MEMS structures on the MEMS wafer. The spacer layer **101** and tape **103** may be may be combined using pressure to promote adhesion. If a non-UV reliant adhesive material is used, the holes or openings in the spacer layer may be laser cut when a UV or IR resistive material is used.

Figure 20 illustrates the bonding of an aligned spacer layer **101** with adhesive layer **103** with a MEMS wafer **13** having MEMS structures **5** and openings **105** corresponding to areas of the MEMS structures **5**. The aligned spacer layer **101** may also be bonded to the MEMS wafer **13** through mechanical means or through bonds produced by applying the aligned spacer layer **101** to the MEMS wafer **13** with a predetermined amount of pressure. The MEMS wafer **13** has formed thereon MEMS structures **5**. In a typical MEMS wafer **13**, there could hundreds to thousands of MEMS structure sites, each containing MEMS structures **5**.

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After the aligned spacer layer **101** with adhesive layer **103** is bonded is a MEMS wafer **13** having MEMS structures **5** and openings **105** corresponding to areas of the MEMS structures **5**, a wafer cap **110** is bonded to the spacer layer **101**, as illustrated in Figure 21. The wafer cap **110** may be a non-perforated cover tape. The non-perforated cover tape and/or spacer layer **101** and adhesive layer **103** comprising a plurality of layers of perforated tape may comprise static dissipative material.

The wafer cap **110** encloses the MEMS structures **5** to protect them from damage. The wafer cap **110** may include an adhesive medium. The adhesive medium of the wafer cap **110** may be an ultraviolet light releasable medium, a heat releasable medium, a combination of an ultraviolet light and heat releasable medium, a thermoplastic organic material, an ultraviolet light sensitive organic material, or a solder material. The wafer cap **110** may also be bonded to the MEMS wafer **13** through mechanical means or through bonds produced by applying the wafer cap **110** to the MEMS wafer **13** with a predetermined amount of pressure.

wafer **13** and between MEMS structure sites **150** to produce cuts or saw kerfs **109**. The dicing may be realized by using a saw, using a laser, or using scribing and breaking.

In Figure 30, the cut dicing cover tape **140** is exposed to an UV radiation source **125** that produces UV radiation **126**. The UV radiation **126** is sufficient to break the bond or release the adhesive between dicing cover tape **140** and the MEMS wafer **13**. The cut dicing cover tape **141** is then heated, via conduction, convection, or by radiation **128** to produce individual releasable cut dicing cover tape pieces **141**, as shown in Figure 31. The application of heat **128** causes the cut dicing cover tape pieces **141** to curl up and away from the MEMS wafer **13** in this embodiment. The cut dicing cover tape pieces **141** are removed together, as illustrated in Figure 32, with a dicing cover tape removal layer **145**. It is noted that the dicing cover tape **140** may be a non-heat shrinkable and/or non-UV releasable tape so that the dicing cover tape **140** could be individually removed without use of UV radiation or heat.

Figure 33 shows dies **200** ready for removal from the spacer layer **250** and wafer cap **270**, which can be accomplished a number of ways. Also possible, but not shown in the figures, is the sawing of individually capped dies, accomplished by simultaneously sawing through the backside cover tape **140** and the spacer **250** and wafer cap **270**. This would be accomplished via the addition of a transfer tape layer to the wafer cap **270** prior to sawing, and subsequent removal of the die **13**, spacer **250**, and wafer cap **270** from the transfer tape layer. The wafer cap **270** and spacer layer **250** may be removed from an individual die before the die is placed in a package or after it is placed in a package.

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Figures 34-41 illustrate another, preferred, process of protecting a MEMS die during a separation and handling process according to the concepts of the present invention. As illustrated in Figure 34, a wafer 13 includes a plurality of MEMS structure sites 150 with corresponding through holes 130 on a backside of the wafer 13. The through holes 130 are holes in the back of the wafer 13 that are formed by etching through the wafer 13 to the front side where the MEMS structure sites 150 are located.

The wafer **13** is capped in Figure 35 with a spacer layer **250** and a wafer cap **270** on a front side or patterned side of the wafer **13**, a front side having the MEMS structure sites **150** located thereon. The spacer layer **250** having openings or holes **105** corresponding with each of the MEMS structure sites **150**. The spacer layer **250** may include an adhesive layer.

The spacer layer **250** may comprise a tape having adhesive on two sides and a flexible film or a flexible film with an adhesive medium on one side. The flexible film may be transmissive to UV radiation and may be about 10 to 20 mils thick. The spacer layer **250** may

In Figure 37, the capped wafer **13** is diced from a backside of the wafer **13** to produce a plurality of capped MEMS dies using a dicing saw **107** with a dicing saw blade **108** rotating in a direction **106**. The dicing occurs through the dicing cover tape **140** and wafer **13** and between MEMS structure sites **150** to produce cuts or saw kerfs **109**. The dicing may be realized by using a saw, using a laser, or using scribing and breaking.

In Figure 38, a second layer of tape **160**; preferably, a standard, non-UV curable adhesive tape; is added to the backside of the diced wafer **13**. The second tape, or transfer tape **160** is applied over the diced the dicing cover tape **140**. This transfer tape **160** is use in transferring the diced wafer **13**, as a whole unit, to another station or stations in the process, such as a station performing die inspection.

In Figure 39, the wafer cap **270** and spacer layer **250** are exposed to UV radiation **126** from a UV source **125**. This exposure by UV radiation **126** enables the wafer cap **270** and spacer layer **250** to be peeled away from the wafer **13** as individual pieces or layers if each layer used a UV releasable adhesive or as a single unit if only the spacer layer **250** used a UV releasable adhesive for bonding to the wafer **13**. By removing the wafer cap **270** and spacer layer **250**, the MEMS structure sites **150** become exposed, ready for inspection, testing, or actual use.

In Figure 40, the cut dicing cover tape **140** and transfer tape **160** are exposed to an UV radiation source **125** that produces UV radiation **126**. In the preferred embodiment, the UV radiation **126** is sufficient to break the bond or release the adhesive between dicing cover tape **140** and the wafer **13** because in the preferred embodiment, the transfer tape **160** uses a non-UV releasable adhesive to bond to the dicing cover tape **140**.

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As shown in Figure 41, individual dies from the cut wafer **13** are lifted off the dicing cover tape **140** and transfer tape **190** with die sorting equipment. In a preferred embodiment, a standard die ejection needle assembly **195** is used to lift off the individual dies of the wafer **13** from the dicing cover tape **140** and transfer tape **190.**

Figure 42 illustrates a preferred process for protecting a wafer during dicing. As shown in Figure 42, at step **S1**, layers of tape **S1A** and **S1C** are mounted or bonded to a carrier ring **S1B**. These layers of tape **S1A** and **S1C** produce an aggregate of layers of tape to produce a height so as to prevent electrostatically induced damage to the MEMS structures on the wafer **S3B** and/or to prevent a wafer cap **S4A** from deflecting in such a manner to come in contact with the MEMS structures on the wafer **S3B**.

In step **S2**, the layers of tape **S1A** and **S1C** are punched **S2A** and **S1C** are so as to produce recesses within the layered tape corresponding to the MEMS structure sites **S2B**. It is